INSTRUCTION MANUAL

POWER SUPPLY

MODEL 1210 / SERIAL A3274

METROLOGY LABORATORY

MP MASTER

MA29431

POWER DESIGNS, INC.
WESTBURY, N. Y.

POWER DESIGNS PACIFIC
PALO ALTO, CAL.

INSTRUCTION MANUAL

METROLOGY LABORATORY

POWER SUPPLY

MODEL 1210 SERIAL A3 277

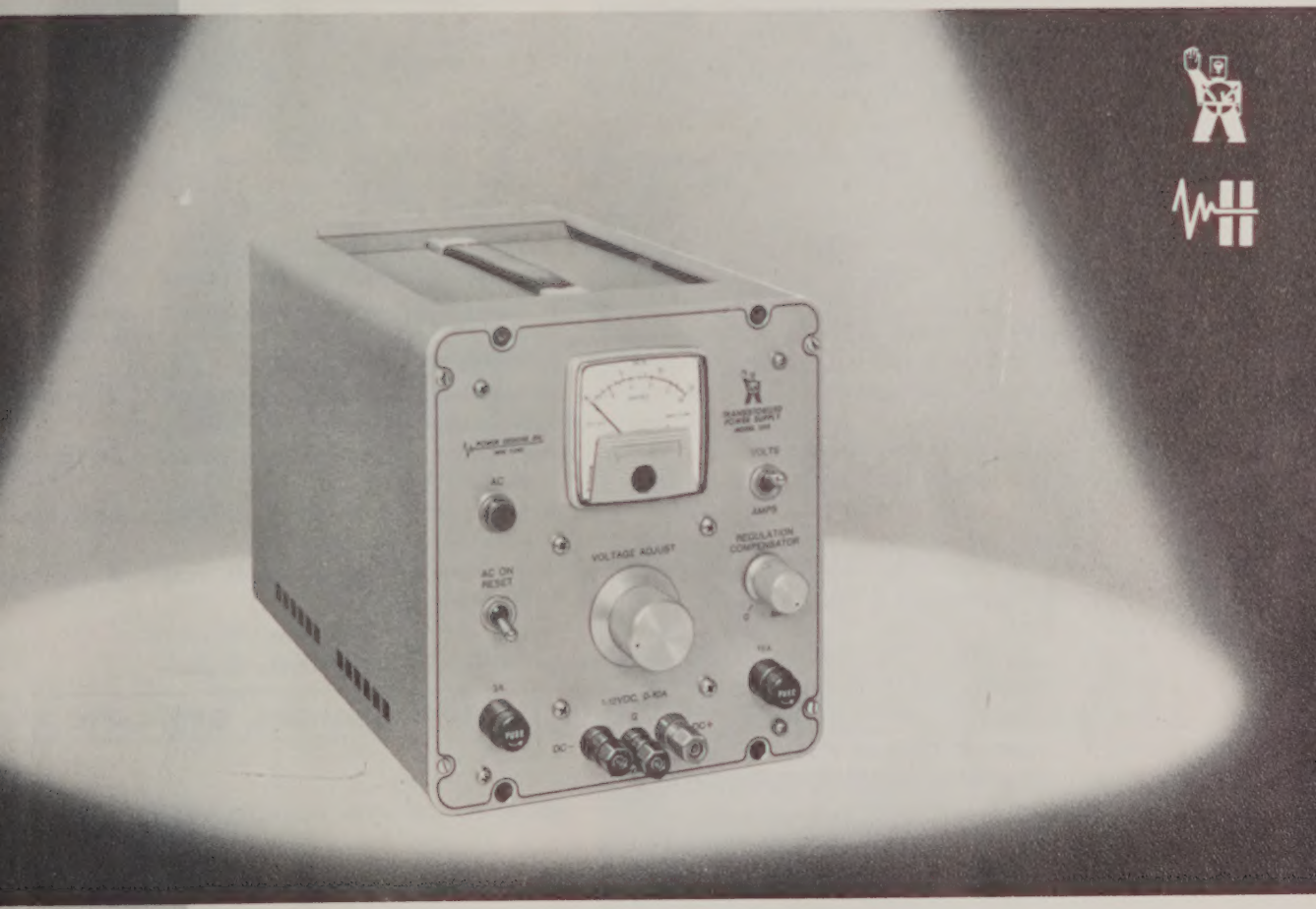
Digitized by the Internet Archive
in 2025

https://archive.org/details/manualsplus_09667

MODEL **1210**

1-12 VDC · 0-10A

POWER DESIGNS



ROBOTEC

HIGH SPEED PROTECTION
AGAINST OVERLOAD and SHORT CIRCUITS

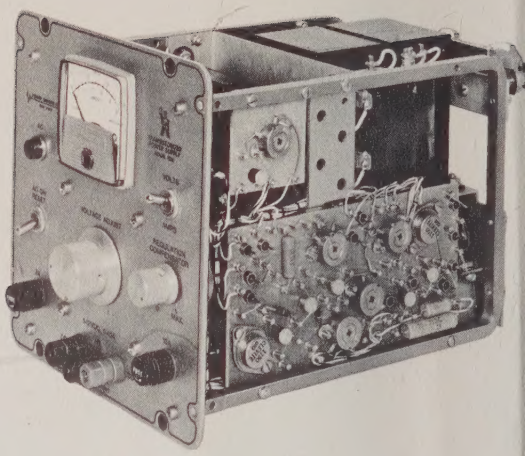
HEATRAN

TRANSISTOR DISSIPATION CONTROL

RECOGNIZED RELIABILITY

MODEL 1210

1-12 VDC • 0-10A



with . . .

ROBOTEC®—a transistorized electronic circuit producing simultaneous voltage and current cutoff upon external overload or short circuit. The "ROBOTEC" circuit operates in thirty microseconds holding the power supply cut off until manually reset and reducing line input power to a negligible value. If an external short circuit exists the power supply cannot be turned on.

HEATRAN® electronic transistor dissipation control — a transistorized circuit continuously monitoring dissipation in the series power transistors of the regulator system. Dissipation above a preset maximum value is automatically transferred into external vitreous enamel resistors extending from the rear of the equipment in a perforated metal cage. "HEATRAN" thus permits fewer transistors for a given power supply capacity, more compact equipment with increased reliability and practical convection cooling.

DESIGN FEATURES:

- Performance specifications based on anticipated ratings at the end of five years of service life.
- Pre-aged germanium transistors with "reliability controlled" parameters for long life expectancy and field interchangeability.
- Semiconductor devices derated to 50% of manufacturers voltage and current ratings.
- Temperature compensated amplifier circuits for maximum stability.
- Silicon voltage references operating in the zero temperature coefficient region.
- Computer quality electrolytic capacitors employed throughout.
- Line and load circuits separately fused.
- Fifty hour preaging prior to final test.

ELECTRICAL SPECIFICATIONS:

INPUT: 105-125 volts, 55-440 cycles*200 watts.

OUTPUT: 1-12 volts dc continuously adjustable at 0-10.0 amperes.

REGULATION: 10 millivolts or .05%, whichever is greater for line or load variations over the operating range.

RIPPLE: Less than 1.0 millivolt RMS.

SOURCE IMPEDANCE: Less than .005 Ω to 20 KC, 0.5 Ω to 1 megacycle.

RESPONSE TIME: Less than 50 microseconds for 100% step changes in rated load.

METER: Front panel volt-ammeter 0-15 volts/0-10.0 amperes monitoring output voltage or current with 1% accuracy at full scale. High torque, shielded core movement in dust-proof case.

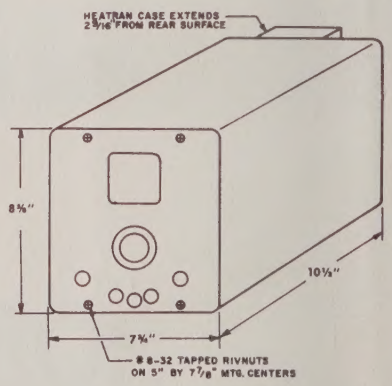
OPERATING TEMPERATURE: Continuous duty at full load −20°C to +50°C ambient.

OUTPUT TERMINALS: Three front panel binding posts. Either positive or negative output terminal may be grounded.

*At nominal line voltage

REP. 5M 9-64 PRINTED IN U.S.A.

MECHANICAL SPECIFICATIO



WEIGHT: 33 lbs.

FINISH: Brushed anodized natural aluminum panel with etched black lettering. Cabinet finished in grey wrinkle enamel.

RACK MOUNTING: Panel adapters available for single or multiple mounting. Request panel adapter catalog sheet, RPA-62.

MODEL 1210 ..... **$349.50** FOB FAC

POWER DESIGNS IN

1700 SHAMES DRIVE, WESTBURY, NEW Y

516 EDgewood 3-6200 TWX: 510-22

POWER DESIGNS PACIFIC, I

3381 Junipero Serra, Palo Alto

415-321-6111 TWX: 910-37

POWER SUPPLY MODEL 1210

1. OPERATING INSTRUCTIONS

1.1 Connect the power supply to a 115v, 50 to 400 cps source and set the AC switch to ON.

1.2 Set the VOLTS-AMPS switch to VOLTS. Adjust the VOLTAGE ADJUST control until the desired output voltage is indicated by the front panel meter.

1.3 Set the REGULATION COMPENSATOR control to zero. Set the VOLTS-AMPS switch to AMPS and the AC switch to OFF. Connect the load to the DC output terminals.

NOTE: Either output terminal may be connected to ground. If neither terminal is grounded, a large capacitor, 0.1 ufd or more, may be connected between one terminal and ground to insure minimum ripple. The voltage between any terminal and ground must not exceed 300 v.

1.4 Set the AC switch to ON. Should the meter indicate zero current, the supply may have "latched" due to excessive current. In this case, increase the resistance of the load and set the AC switch to OFF and then back to ON. This will reset the latching circuit.

1.5 Should long leads be used to connect the load to the power supply, the voltage drop in the leads may cause a loss of regulation at the load. The REGULATION COMPENSATOR control is used to compensate for lead losses. The control is adjusted so that the voltage across the load is maintained constant with and without load current flowing.

POWER SUPPLY MODEL 1210

2. MAINTENANCE - The tests given below should be performed at six month intervals or whenever Q.C. programs require routine maintenance.

2.1 Test Equipment - The following test equipment or equivalent instruments must be used for these tests:

1.	Differential Voltmeter	J. Fluke 825A
2.	Variac	Superior 1126
3.	AC Millivoltmeter	Ballantine 861
4.	1-Milliohm Shunt	
5.	Variable Load Resistor	0 to 1.4Ω, 150 watts

2.2 Preliminary

2.2.1 Connect the power supply AC input to the variac output. Set the variac to supply 125 vac. Connect the 1.4Ω load and 1 milliohm shunt in series across the DC output terminals.

2.2.2 Set the AC switch to ON. Set the VOLTS-AMPS switch to VOLTS. Rotate the VOLTAGE ADJUST control fully CW.

2.2.3 Connect the differential voltmeter across the 1-milliohm shunt.

2.3 Voltage Range

2.3.1 Adjust R29 until the panel meter indicates 14 vdc.

2.4 Meter Calibration

2.4.1 Adjust the VOLTAGE ADJUST control until the differential voltmeter indicates 10 mvdc. Set the VOLTS-AMPS switch to AMPS.

2.4.2 Adjust R27 until the panel meter indicates 10 amperes.

A3-277
METROLOGY
LABORATORY

2.5 Regulation Adjustment

2.5.1 Connect the differential voltmeter between the DC+ and DC- terminals. Disconnect the load and set the output voltage to 14 vdc.

2.5.2 Reconnect the load and adjust R30 until the output voltage is again 14 vdc.

2.6 Series Pass Adjustment

2.6.1 Set the dc output voltage to 14 v and the ac input voltage to 105 v.

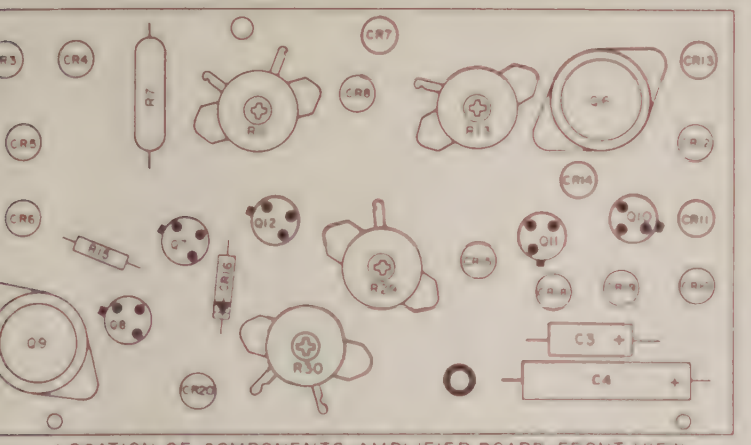
2.6.2 Connect the voltmeter between Q5 collector and emitter. Adjust R13 until the voltmeter indicates 0.55 vdc.

2.6.3 Set the ac input voltage to 125 v. Connect the voltmeter across R6.

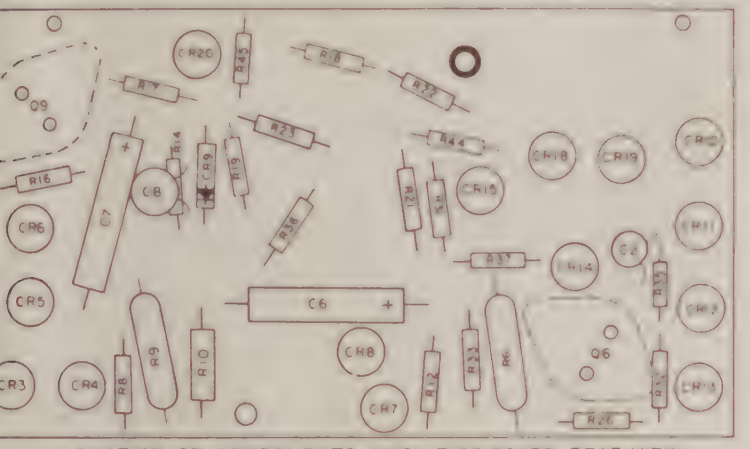
2.6.4 Adjust R11 until the voltmeter indicates 0.4 v.

2.7 Latch Circuit Adjustment

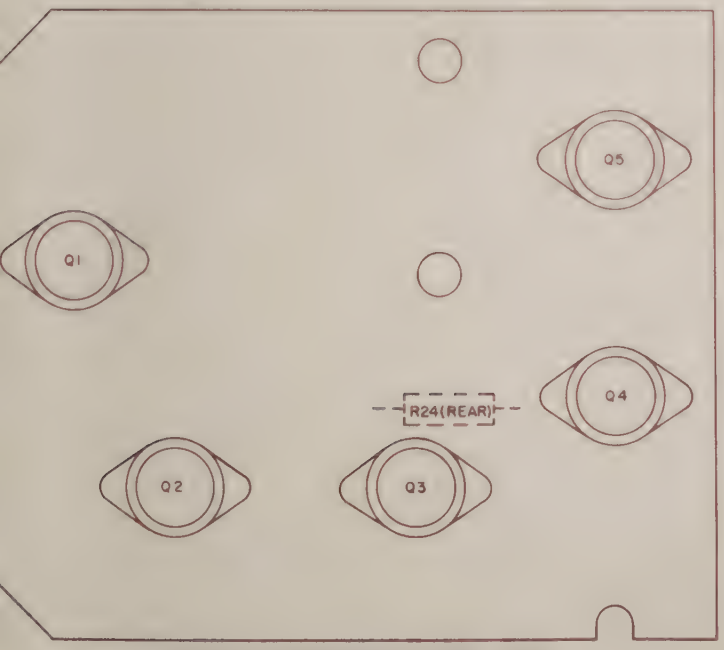
2.7.1 Replace the 10-ampere fuse with a 15-ampere fuse. Adjust the value of the load resistor until output voltage suddenly drops to zero. This should occur as soon as the load current rises to 13 amperes. Adjust if necessary with R5. Replace the 10-ampere fuse.



LOCATION OF COMPONENTS-AMPLIFIER BOARD-FRONT VIEW

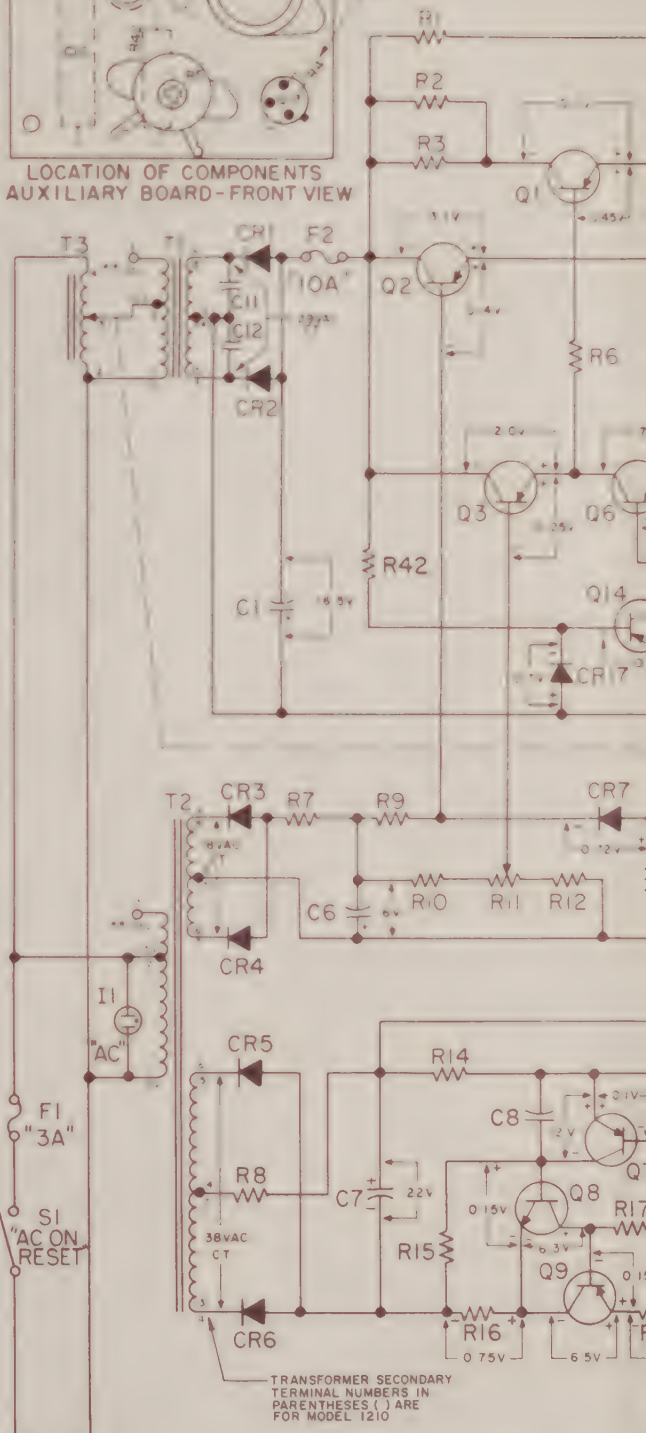


LOCATION OF COMPONENTS-AMPLIFIER BOARD-REAR VIEW



LOCATION OF COMPONENTS-HEAT SINK

LOCATION OF COMPONENTS
AUXILIARY BOARD-FRONT VIEW



VOLTAGES INDICAT
WITH A 10 AMP LOA
COMPENSATION. M
AND 1000Ω/VOLT F
INDICATED.

** TAP FURNISHE

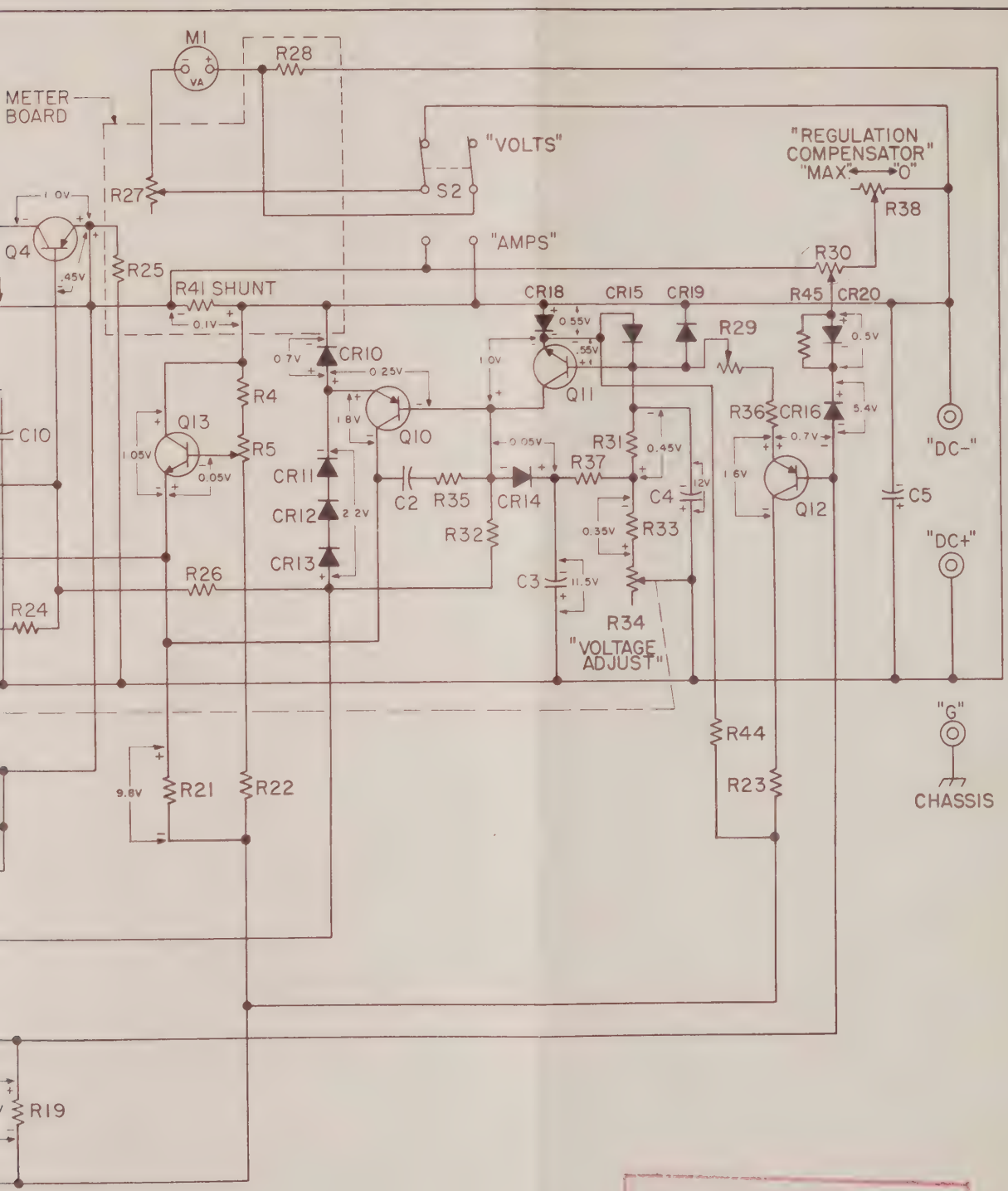
105-125V
55-440~ } MOD. 1210

105-125V/115-135V
55-440~ } ** MOD. 1210/125

WG. NO. PS-1210-13

ODEL 1210, 1210/125
RANSISTORIZED POWER SUPPLY

1-12VDC,0-



A3-277
METROLOGY
LABORATORY

MEASURED WITH 115VAC INPUT AND 12VDC OUTPUT
"REGULATION COMPENSATOR" R38 SET TO "0"
MENTS MADE WITH 20,000Ω/VOLT METER FOR DC
VOLTAGES ARE DC EXCEPT WHERE OTHERWISE

MODEL 1210/125.

SYM.	DESCRIPTION	APP'D.	DATE
	REVISIONS		

DRAWN R.A.S.	CHECKED as	APP'D. MR
DATE 8/17/62	DATE 8/17/62	DATE 8/17/62

* PATENTS PENDING

POWER DESIGNS INC.
NEW YORK

24 AUGUST 1964

ELECTRICAL PARTS LIST, MODEL 1210

NOTES: 1. ALL ELECTROLYTIC CAPACITORS ARE HIGH PURITY FOIL "COMPUTER QUALITY" TYPES WITH A LIFE EXPECTANCY IN EXCESS OF 10 YEARS.

2. REPLACEMENT TRANSISTORS SHOULD BE OBTAINED FROM POWER DESIGNS INC. COMMERCIALLY EQUIVALENT TRANSISTORS HAVE WIDE PARAMETER TOLERANCES WHICH MAY RENDER THEM UNSUITABLE FOR USE IN DC AMPLIFIER CIRCUITRY. REPLACEMENT OF TRANSISTORS WITH COMMERCIAL EQUIVALENTS MAY RESULT IN DEGRADATION OF PERFORMANCE.

CIRCUIT DESIGNATION	DESCRIPTION	FACTORY PART NO.
C1	CAPACITOR, ELECTROLYTIC, 30,000 MF, 25 VDC	CE-37-.25
C2	CAPACITOR, CERAMIC DISC, .0022 MF, 1KV	CC-19-10
C3	CAPACITOR, ELECTROLYTIC, 8 MF, 25 VDC	CE-21-.25
C4, C7, C10	CAPACITOR, ELECTROLYTIC, 70 MF, 25 VDC	CE-19-.25
C5	CAPACITOR, ELECTROLYTIC, 10,000 MF, 15 VDC	CE-40-.15
C6	CAPACITOR, ELECTROLYTIC, 250 MF, 12 VDC	CE-22-.12
C8	CAPACITOR, CERAMIC DISC, .01 MF, 1 KV	CC-13-10
C11, C12	CAPACITOR, CERAMIC DISC, 0.1 MF, 200 VDC	CC-24-2
CR1, CR2	DIODE, SILICON, RECTIFIER	G1580
CR3 THRU CR8	DIODE, SILICON, RECTIFIER	F1044P
CR10 THRU CR15	DIODE, SILICON, RECTIFIER	F1044P
CR17 THRU CR20	DIODE, SILICON, RECTIFIER	F1044P
CR9	DIOIDE, SILICON, ZENER	CDC359B
CR16	DIODE, SILICON, ZENER	CDC359A
F1	FUSE, MDX 3 "SLO BLO"	----
F2	FUSE, TYPE MDL 10 "SLO BLO"	----
M1	METER, DUAL VOLT-AMMETER ASSEMBLY, 0-15V/ 0-10A, 2-1/2" RECT.	MVA-90
Q1, Q2, Q4, Q5	TRANSISTOR, PNP, GERMANIUM	M1547
Q3	TRANSISTOR, PNP, GERMANIUM	CQ1077
Q4, Q6, Q9	TRANSISTOR, PNP, GERMANIUM	CTP1150A
Q7, Q10	TRANSISTOR, PNP, GERMANIUM	2N360F
Q8, Q13	TRANSISTOR, NPN, GERMANIUM	RA35P
Q11	TRANSISTOR, NPN, SILICON	FS696
Q12	TRANSISTOR, PNP, SILICON	FS1027
R1, R2, R3	RESISTOR, WIREWOUND, 1.5Ω, ±5%, 45W	RWF-015-P3
R4, R45	RESISTOR, COMPOSITION, 82Ω, ±10%, ½W	----
R5	RESISTOR, WIREWOUND, ADJUSTABLE TRIMMER, 100Ω, ±10%, 1-1/4W	RWT-101-C4

ELECTRICAL PARTS LIST, MODEL 1210 (CONTINUED

CIRCUIT DESIGNATION	DESCRIPTION	FACTORY PART NO.
R6	Resistor, Wirewound, 1Ω, ±5%, 5W	RW-010-3DA
R7	Resistor, Wirewound, 3Ω, ±5%, 5W	RW-030-3DA
R8, R33, R16, R18	Resistor, Composition, 10Ω, ±10%, ½W	----
R9	Resistor, Wirewound, 15Ω, ±5%, 5W	RW-150-3DA
R10	Resistor, Composition, 33Ω, ±10%, 1W	----
R11, R13	Resistor, Wirewound, Adj. Trimmer, 100Ω ±10%, 1-1/4W	RWT-100-C4
R12	Resistor, Composition, 22Ω, ±10%, ½W	----
R14, R22	Resistor, Composition, 1000Ω, ±10%, ½W	----
R15, R35	Resistor, Composition, 56000Ω, ±10%, ½W	----
R17, R21	Resistor, Composition, 5600Ω, ±10%, ½W	----
R19	Resistor, Composition, 470Ω, ±5%, ½W	----
R23, R36	Resistor, Composition, 120Ω, ±5%, ½W	----
R24	Resistor, Wirewound, 150Ω, ±5%, 5W	----
R25	Resistor, Composition, 220Ω, ±10%, 2W	----
R26	Resistor, Composition, 100Ω, ±10%, ½W	----
R27, R29	Resistor, Wirewound, Adj. Trimmer, 50Ω, ±10% 1-1/4W	RWT-500-C4
R28	Resistor, Precision, 14.9K, ±0.5%, 1/4W	RW-14.92-TQ
R31	Resistor, Composition, 12Ω, ±5%, ½W	----
R32	Resistor, Composition, 22K, ±10%, ½W	----
R30	Resistor, Wirewound, Adj. Trimmer, 2Ω, ±10% 1-1/4W	RWT-020-C4
R34	Resistor, Variable, Wirewound, 5000Ω, ±5%, 4W (Part of TTV-38-2 Assy.)	RWV-5011M4-5.06
R37	Resistor, Composition, 150Ω, ±10%, ½W	----
R38	Resistor, Variable, Wirewound, 6Ω, ±10%, 2W	RWV-C6C-C4-.87
R41	Resistor, Part of Meter Board Assembly	RWF00010
R42	Resistor, Composition, 390Ω, ±10%, 2W	----
R43	Resistor, Composition, 5.6Ω, ±5%, ½W	----
R44	Resistor, Composition, 10KΩ, ±10%, ½W	----
S1	Switch, Toggle, SPST, 15A, 125V	ST-5
S2	Switch, Toggle, DPDT, 15A, 125V	ST-16
T1	Transformer, Power	TTH-18
T2	Transformer, Auxiliary	TTH-11
T3, R34	Autotransformer, Assembly, Variable	TTV-3B-2
I1	Light Assembly, Pilot	PLA-1

CODE LIST OF MANUFACTURERS

Code No.*	Manufacturer	Address
98095	Power Designs, Inc.	Westbury, New York
93410	Stevens Mfg. Co., Inc.	Mansfield, Ohio
91662	Elco Corporation	Philadelphia, Pa.
56289	Sprague Electric Co.	North Adams, Mass.
37942	P. R. Mallory and Co., Inc.	Indianapolis, Ind.
15605	Cutler-Hammer Inc.	Milwaukee, Wisconsin
14841	Ward Leonard Electric Co.	Hagerstown, Maryland
09688	General Precision Inc.	Tarrytown, New York
07115	Corning Glass Works Electric Components Dept.	Bradford, Pa.
04713	Motorola, Inc. Semi-conductor Prod. Div.	Phoenix, Arizona
03614	Bussman Mfg. Division of McGraw Edison Co.	Los Angeles, Calif.
02735	Radio Corporation of America Semi-conductor and Materials Div.	Somerville, N. J.
01121	Allen Bradley Company	Milwaukee, Wis.

*From Federal Supply Code for Manufacturers Catalog (H4-1, Name to Code, and H4-2, Code to Name)

WARRANTY

POWER DESIGNS INC., warrants to the original purchaser, each instrument sold by us, or our authorized agents, and all the parts thereof, to be free from defects in material or workmanship under normal use and service within the specified ratings and operating conditions.

Its obligation under this warranty is hereby limited to the repair or replacement of any instrument, or part thereof, which is returned to us within one year after delivery, and which shall prove, after our examination, to be thus defective.

This warranty does not include the cost of transportation charges to and from the factory and/or the cost of packaging or crating of instruments for return to the factory, unless such instrument is returned within thirty (30) days from the date of original shipment as shown on the packing list or shipping documents, and prior written authorization for such costs is obtained from the factory.

The repair or replacement of an instrument, or any part thereof, does not void or extend the original warranty.

POWER DESIGNS INC., reserves the right to discontinue any instrument without notice, or to make modifications in design at any time, without incurring any obligation to make these modifications in instruments previously sold.

POWER DESIGNS INC.
Westbury, L. I., New York

POWER DESIGNS PACIFIC, INC.
Palo Alto, California

A3-277
METROLOGY
LABORATORY

MP MASTER
MA29431